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How To

Identify LOPHODERMIIUM and BROWN SPOT Diseases on Pine



NORTH CENTRAL FOREST EXPERIMENT STATION
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Two needlecast fungus diseases — *Lophodermium pinastri* and brown spot (*Scirrhia acicola*) — have recently become serious problems on red and/or Scotch pines in forest tree nurseries and Christmas tree plantations in the north-central States. Since 1966, millions of seedlings and trees have been damaged or killed by one or the other of these diseases. Damage has been most severe on red pine seedlings and short-needled Scotch pine varieties of all ages.

Both diseases can be controlled—but early detection is essential. Precise identification is difficult, however, because the disease symptoms are so similar. Described and illustrated here are the symptoms by stages, with special emphasis on the distinguishing features. The exact timing of the diseases' progress may vary somewhat with geographic location. But these are the clues to look for.

Control measures currently recommended are described in the following publications:

- For *Lophodermium*:

Nicholls, T.H., and D.D. Skilling. 1974. Control of *Lophodermium* needlecast in forest nurseries and Christmas tree plantations. USDA For. Serv. Res. Pap. NC-110, 11 p., illus. North Cent. For. Exp. Stn., St. Paul, Minn.

- For brown spot:

Skilling, D.D., and T.H. Nicholls. 1974. Brown spot needle disease — biology and control in Scotch pine plantations. USDA For. Serv. Res. Pap. NC-109, 19 p., illus. North Cent. For. Exp. Stn., St. Paul, Minn.

For more information on these diseases or to obtain copies of the above publications contact:

Northeastern Area
State & Private Forestry
6816 Market Street
Upper Darby, PA 19082

or

North Central Forest
Experiment Station
Folwell Avenue
St. Paul, MN 55108

NEEDLECAST STAGE

Look for: Tiny spots on the needles. Spots are gray-black at first but later develop brown centers and yellow margins.

Lophodermium

Appear in early spring.

Brown spot

Appear in late summer.

BROWNING STAGE

Needles eventually turn yellow, then brown.

Look for: Brown needles.

Lophodermium

Needles brown in spring;
degree of browning in-
creases from top to bot-
tom of tree (left).

Brown spot

Needles brown in fall;
browning usually con-
fined to lower half of
tree (right).

Generally, new buds develop as usual in older nursery stock and Christmas trees.

Look for: Fresh needle growth on tips of branches ahead of old, dead, brown needles.

FRUITING STAGE

Fungus fruiting bodies develop on dead needles, either on the tree or on the ground.

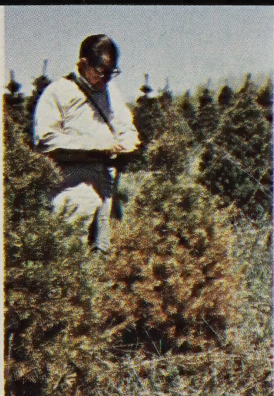
Look for: Tiny, black fruiting bodies on dead needles.

Lophodermium

Conspicuously protruding
when wet; football-
shaped, slit down middle
(left).

Brown spot

Slightly protruding when
wet; flush with surface
of needle when dry
(right).



CULTURING TECHNIQUES

Sometimes the only sure way to identify these diseases is to culture the imperfect stages. Using normal, sterile isolation techniques, here is how to do it:

- Soak 15 to 30 spotted needles in a 1:10 hypochlorite solution (household bleach and water) for about 1 minute to surface sterilize them.
- Remove needles from solution and cut a 3-mm. section from each needle, being sure to include both healthy tissue and part of the needle spot.
- Place needle sections on top of potato dextrose agar in petri dish and incubate at about 68° F. in the dark for 10 to 15 days. Examine culture every 5 days.

Lophodermium

Grows mostly below the agar surface. Begins growth as a colony of fine white mycelium but after 7 to 10 days mycelium color may range from white to brown.

Brown spot

Grows slowly, producing masses of conidia in a dark, olive-green gelatinous matrix, mostly above the agar surface. A white or grayish-white mycelium may grow around the margin of the culture or be scattered over the top.



SPORES

Fungus spores are released during rainy weather.

Look for: Spores inside fruiting bodies.

Lophodermium

Translucent, thread - like
ascospores are wind-dis-
seminated in late summer
and fall.

Brown spot

Olive - green, crescent -
shaped, 3-parted spores
are rainsplash dissemin-
ated throughout growing
season.



THOMAS H. NICHOLLS

Principal Plant Pathologist
North Central Forest Experiment Station
St. Paul, Minnesota

H. DANIEL BROWN

Field Representative
Northeastern Area, State and Private Forestry
Delaware, Ohio

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